Y S416/2.2 E56

STATE LIBRARY OF PENNSYLVANIA
3 0144 00135994 2

ENERGY FOR PENNSYLVANIA

Executive Summary Report

An Action Plan for Energy Management in the Commonwealth of Pennsylvania

to GOVERNOR MILTON J. SHAPP

by the GOVERNOR'S SCIENCE ADVISORY COMMITTEE

September 1973

CONTENTS

Page

PROLOGUE ii

PENNSYLVANIA'S ENERGY NEEDS iii-iv

The Good News
The Bad News

SUMMARY 1

I. Background

II. Commonwealth Action

RECOMMENDATIONS 2-4

I. Public Policy: An Overriding Need

II. Energy Needs in the 70's

III. New Energy Opportunities for the 80's

GOALS AND APPROACHES 5-7

I. A Commonwealth Energy Management Strategy

II. Energy for the 70's

III. Clean Energy for the 80's: Leadership in New Technologies

Acknowledgement 8

Members of the Governor's Science Advisory Panel on Energy Management 9

PROLOGUE

Governor Milton J. Shapp met with the Governor's Science Advisory Committee (GSAC) early in 1972 and charged them with the responsibility of recommending to him ways of meeting an anticipated energy deficit in Pennsylvania. Policy considerations and an understanding of Pennsylvania's unique role in the energy economy of the United States were to be a part of the GSAC study.

This report on the interaction of technology and the three E's - Energy, Environment, and Economy - is based on work during the past year of a special panel of the Governor's Science Advisory Committee (GSAC). It endeavors to identify significant technological trends and options with special relevance to Pennsylvania.

The Energy Panel's findings were thoroughly discussed both in their deliberations and with the entire Governor's Science Advisory Committee. There is agreement on the urgency and importance to Pennsylvania of proper development of nuclear power and of the three C's - Conservation of energy, Conversion to Coal (in the 70's), and Conversion of Coal to sulfur-free gas and oil (for the 80's).

Governor Shapp, aware of the need for urgency, recently created an Energy Task Force comprised of the heads of the state agencies responsible for Commonwealth programs. The need for wise energy use, an adequate energy supply, a quality environment, and a healthy economy demands focused attention on energy developments during the critical years of the mid-70's.

Currently, GSAC panels are preparing reports scheduled for early 1974 on Criteria for Power Plant and Transmission Line Siting in Pennsylvania and on Pennsylvania's Opportunities for Transportation Developments.

The best judgments of informed Pennsylvanian's are needed to guide energy management in Pennsylvania and we believe that this report can contribute to such considerations.

PENNSYLVANIA'S ENERGY NEEDS

THE GOOD NEWS

PENNSYLVANIA'S FUEL DEMANDS

- Overall, Pennsylvania:

  --Uses more coal (38% of Pennsylvania fuel needs) than the U. S. average (17% of U. S. use).

  --Uses less natural gas (17% of Pennsylvania needs) than the U. S. average (27% of U. S. fuels).

- Pennsylvania Industry

  --Uses much coal (55% of its fuel needs) and little petroleum (17% of needs)

- Pennsylvania Utilities

  --Currently generate nearly two-thirds of their electricity from coal.

  --On completion of 9 new plants (by 1981?) will DOUBLE CAPACITY with 1/3 from nuclear fuels and less than 1/6 from petroleum.

PENNSYLVANIA'S ENVIRONMENT

--Primary air standards can be met with minor variances for short periods.

--Modern machinery and techniques for strip mining and land restoration provide both excellent environmental protection and low cost coal.

Digitized by the Internet Archive
in 2017 with funding from
This project is made possible by a grant from the Institute of Museum and Library Services as administered by the Pennsylvania Department of Education through the Office of Commonwealth Libraries

https://archive.org/details/energyforpennsyl00penn

PENNSYLVANIA'S ENERGY NEEDS

THE BAD NEWS

IMPACT OF THE SHORTAGE

--75% of Pennsylvania residential and commercial heating is supplied by scarce oil and natural gas; transportation is almost completely dependent on scarce petroleum.

--Apportioning fuels will mean cutbacks in heating and air conditioning, auto and air travel, and industrial operations (affecting jobs and incomes).

BARRIERS TO AN INCREASED FUEL SUPPLY

--There exist delays in the construction of the 6 planned nuclear power plants scheduled by 1981.

--The coal industry is in decline and the scarcity of capital, skilled manpower, and equipment slows its revival.

--Greater use of coal in the 70's may require some temporary variances in meeting primary air quality standards and may be limited unless application of secondary air standards is somewhat delayed.

--Pennsylvania is short of facilities to refine petroleum and to transport and store petroleum and natural gas.

--Federal import, pricing, and environmental regulations discourage development of domestic petroleum and natural gas and refineries.

--The logistics of importing oil requires huge tankers and major off-shore deep-water ports, which do not now exist.

SUMMARY

I. BACKGROUND: GOALS AND OPTIONS

--Energy will no longer be abundant and cheap. Conservation must be the bedrock of the new energy management policy. Improved technology and sound public policy are essential.

--Coal is a key to U. S. self sufficiency in energy. Nuclear power is another. Pennsylvania has much coal and is a leader in the nuclear industry.

--Pennsylvania can move into the era of modern coal technology wherein coal will be transformed into clean, readily-available fuels.

--Development of new technology takes time. Till then, Pennsylvania must use the best available coal and nuclear technology and environmental criteria.

II. COMMONWEALTH ACTION: A PENNSYLVANIA ENERGY MANAGEMENT STRATEGY

To meet the energy shortages of the 70's and to benefit from new developments for the 80's, the Commonwealth must establish:

--Public Policies - based on on-going knowledge and understanding of changing developments and options.

--A Plan for the 70's - using incentives and controls and the best current technology to reduce energy demands and to increase the supply in the shortages of the 70's.

--Action for the 80's - with early participation of Pennsylvania institutions in imminent Federal and corporate developments of new clean energy technologies for the 80's.

The Governor's Science Advisory Committee and its Energy Management Panel recommend actions to meet these three needs. Accordingly, five recommendations for executive and/or legislative action are presented (pp. 2-4) with references to specific approaches which follow (pp. 5-7).

RECOMMENDATIONS

I. PUBLIC POLICY: AN OVERRIDING NEED

TARGET: Public policies must assure the delivery and wise use of energy by means consistent with environmental and economic goals.

● RECOMMENDATION: COMMONWEALTH ENERGY POLICY COUNCIL(S)

The executive and legislative branches should establish (jointly or separately) Energy Policy Council(s) to expedite policy and decision making and to monitor and support implementation of the Commonwealth's energy policies by the state's action agencies.

(Specific tasks are suggested on page 5.)

ACTION: The Governor should issue executive directives and recommend that the legislature consider appropriate actions and legislation.

● RECOMMENDATION: ADEQUATE STAFF FOR ENERGY DATA ANALYSIS AND DECISION MAKING

The Energy Policy Council(s) and the state's action agencies should be provided with staff adequate to provide data, analytic services, and project review on energy and environment issues.

ACTION: The appropriate agencies and the Office of State Planning and Development should formulate recommendations for the necessary staff and budgets then submit them to the Governor.

RECOMMENDATIONS

II. ENERGY NEEDS IN THE 70's

TARGET: To avert crises the Commonwealth can use legal and economic incentives and controls to reduce energy demands and to increase the energy supply. The Commonwealth should promote the use of the best available technology and environmental criteria to achieve:

--Wise Use and Conservation of Energy

--Effective Use of Current Nuclear and Coal Technologies

--Expansion of Pennsylvania's Energy Supply and Distribution Systems

(Specific approaches to these ends are suggested on page 6)

● RECOMMENDATION: COORDINATED COMMONWEALTH ENERGY PROGRAMS

Under the guidance of the Energy Policy Council(s) (recommended above) the appropriate state agencies should coordinate their actions with Pennsylvania industries, universities and with Federal agencies, to achieve the above targets.

ACTION: The Energy Policy Council(s) in concert with the Public Utilities Commission, the Department of Environmental Resources, the Department of Commerce, the Department of Transportation, the Office of State Planning and Development, and other state agencies should investigate current programs, resources, and activities and formulate action programs.

● RECOMMENDATION: ADDITIONAL OPTIONS

The Governor should consider for further action:

Use of incentives to encourage energy conservation and equipment for improvement of environment.

Means to help utilities finance energy producing facilities.

Encouragement of deep-well drilling for oil and gas in Pennsylvania.

Means to develop deep-water ports for Pennsylvania's use.

Support of national policy for off-shore drilling on Atlantic Shelf and Gulf and Pacific coasts, Alaskan oil development, and possible use of western oil shale for increased domestic supply of natural gas and petroleum.

ACTION: The Governor should direct immediate consideration of the foregoing and recommendations as appropriate by: The Commonwealth's Energy Policy Council(s), The Department of Environmental Resources, Environmental Quality Board and Citizens Advisory Council, The Department of Commerce, Office of State Planning and Development's State Planning Board, and other appropriate State agencies and private organizations and institutions.

RECOMMENDATIONS

III. NEW ENERGY OPPORTUNITIES FOR THE 80's

Developments in converting coal to clean burning oil or gas will create new industries and transform existing ones. These will move ahead immediately, with increases in Federal energy research funds of $100 million this year and $2 billion per year for the next five years, as well as major new funding in the private sector.

Pennsylvania, favored with abundant coal, leadership in supplying nuclear plants, research centers in coal and nuclear science, many engineering and processing firms, and a power-dependent industry, stands to reap major benefits in the new coal and nuclear era ahead.

TARGET: The Commonwealth should promote early participation of Pennsylvania's industry and universities in new developments of:

--Efficient Energy Use

--Modern Coal and Nuclear Technologies

--A Domestic Petroleum Supply

--Protection of Environment and Health

(Specific approaches to these ends are suggested on page 7)

● RECOMMENDATION: ENERGY RESEARCH AND DEVELOPMENT

The legislature should provide funds to the Pennsylvania Science and Engineering Foundation (PSEF) to seed research and development in Pennsylvania with Federal and private funding of modern energy technologies listed above. Funding at a scale of at least one million dollars per year for an estimated five years is required.

ACTION: The Governor should recommend and the legislature should appropriate an additional $1 million for PSEF for fiscal year 1973-74.

GOALS AND APPROACHES

I. A COMMONWEALTH ENERGY MANAGEMENT STRATEGY

The Commonwealth's Energy Policy Council(s) (recommended above) working through and supporting the state's action agencies should, for example:

--Expedite policy, planning, and decision-making on all energy questions while meeting primary environmental and economic goals.

--Participate in setting Federal energy and environmental policies.

--Establish contingency plans for handling fuel shortages.

--Promote the conservation and wise use of energy.

--Submit to the Federal government an attainable schedule for secondary environmental standards to permit use of coal in the shortages of the 70's.

--Intensify and expedite the review of applications for mining operations, power plants, refineries, and other energy facilities.

--Promote the collection and use of solid wastes for direct or indirect use as fuels.

--Provide adequate staff so that the Council(s) and the state agencies can make policy decisions and take prompt action on the basis of pertinent data and analysis of on-going energy developments.

GOALS AND APPROACHES

II. ENERGY FOR THE 70's

Early and wide use must be made of best available technologies to assure health, comfort, and jobs for Pennsylvanian's at acceptable environmental and economic costs. Such a Pennsylvania program must promote:

WISE USE AND CONSERVATION OF ENERGY

--Provide public information and education for more effective use of energy.

--Modify building codes and design practices to encourage application of current technology to conserve energy.

--Keep and strengthen rail transportation for piggyback and other freight in Pennsylvania.

--Strengthen mass transportation and promote its use.

--Examine a modified rate structure for use of electricity.

--Plan for long-term conservation of petroleum.

EFFECTIVE USE OF CURRENT NUCLEAR AND COAL TECHNOLOGIES

--Expedite construction of nuclear power plants with proper safety features.

--Convert to coal for producing power.

--Increase coal production; lower sulfur first; train coal mining manpower.

--Reduce sulfur content in bituminous coal by mechanical means and use more low-sulfur anthracite when practicable.

--Use combustion and post-combustion processes for sulfur removal or dispersal, as determined to be effective including; addition of lime or dolomite to coal; stack gas scrubbing; and/or use of tall stacks.

--Use available technologies to meet primary air standards, employing temporary minor variances if necessary to meet critical energy shortages, with monitoring, strict controls, and a reserve of clean fuels for use during an atmospheric inversion.

EXPANSION OF PENNSYLVANIA'S ENERGY SUPPLY AND DISTRIBUTION SYSTEMS

--Develop power plant and transmission line siting criteria for developments till the year 2000 and beyond.

--Create climate for effective financing of construction of refineries and oil and gas storage and other energy and fuel distribution systems.

--Use wood and urban, agricultural, and industrial wastes as energy sources where practicable.

III. CLEAN ENERGY FOR THE 80's: LEADERSHIP IN NEW TECHNOLOGY

Aggressive Pennsylvania participation is required NOW in vigorous development of new clean energy options for the 80's. Such a Pennsylvania program should promote:

EFFICIENT ENERGY USE:

--New means for energy conservation and efficient use.

--Means to convert wastes to fuel or direct heat, with enabling legislation and incentives to promote waste collection and use.

--Develop mass transit and rail freight facilities with incentives for their use.

MODERN COAL AND NUCLEAR TECHNOLOGY

--Intensify the detailed geologic and mapping data gathering of Pennsylvania's coal, oil, and gas reserves.

--Develop improved technologies for mining, cleaning, transportation and burning of coal and subsequent disposal of wastes.

--Support conversion of coal to oil and gas: accelerate research and development, identify and dedicate appropriate coal fields, and provide incentives and financial help for implementation.

--Encourage development of nuclear technology with emphasis on safety and disposal of heat and wastes.

--Stimulate growth of energy equipment manufacturing and engineering industries in Pennsylvania.

A DOMESTIC PETROLEUM SUPPLY

--Develop technical and economic means to get more oil and gas from Pennsylvania fields.

--Consider drilling for gas in Lake Erie.

PROTECTION OF ENVIRONMENT AND HEALTH

--Encourage Federal and Private sector research, with participation of Pennsylvania institutions on the fate of pollutants from combustion processes, on their effects on human health, materials, urban and rural environments, on new technologies for coal mining, and on energy production and use which maximize the protection of human health and the environment.

ACKNOWLEDGEMENT

The work of the Energy Management Panel was greatly enhanced by the personal interest of Governor Shapp and by the invaluable support provided by Mr. Walter Arader, Secretary of Commerce, and by members of his staff, including especially Mr. Robert D. Laughlin, Director, Bureau of Scientific & Technological Development, Mr. I. J. Sobel, Program Manager, and by Mr. Albert E. Smigel, Director, Bureau of Statistics, Research and Planning. We were greatly aided by the interest of Mr. A. Edward Simon, Director of the Office of State Planning and Development, and the personal participation of Mr. Robert Sidman, Coordinator and Mr. Frederick D. Grundeman, Staff Consultant of that office. Valuable information and comments were made by other state agencies, especially by Dr. Maurice Goddard, Secretary, Department of Environmental Resources, and by Mr. Wesley E. Gilbertson, Dr. Arthur Socolow, Mr. Clifford H. McConnell, and others of the DER staff.

The evident interest of members of the legislature in technological and other considerations affecting Pennsylvania's energy needs and environment was also a spur to the work of this panel.

The panel wished to acknowledge, with grateful appreciation, the help of many others who provided input to this report. Although much of the material provided is not directly referenced, it significantly influenced the assessment of options and the recommendations presented herein.

MEMBERS
GOVERNOR'S SCIENCE ADVISORY COMMITTEE

**Dr. Thomas G Fox (Chairman)
Governor's Science Advisor
Carnegie-Mellon University

Dr. W. I. Buchert
President
Geisinger Medical Center

*Dr. Carl C. Chambers
University Professor of Electrical Engineering
University of Pennsylvania

*Mr. Richard H. Demmy
Vice President
UGI Corporation

*Dr. S. William Gouse, Jr.
Director, Environmental Studies Group
Associate Dean, College of Engineering & School of Urban & Public Affairs
Carnegie-Mellon University

*Dr. Herschel E. Griffin, Dean
Graduate School of Public Health
University of Pittsburgh

Mr. Charles M. Heiden
Manager, Transportation Systems Strategic Planning Operations
General Electric Corporation

Dr. George Huganir
Special Assistant to the President
Temple University

*Dr. Alexander Lewis, Jr.
Senior Vice President
Gulf Oil Corporation

Dr. Joseph F. Libsch
Vice President for Research
Lehigh University

Dr. Francis J. Michelini
President
Wilkes College

***Dr. N. J. Palladino
Dean, College of Engineering
Pennsylvania State University

*Dr. Ruth Patrick
Curator and Chairman
Limnology Department
Academy of Natural Sciences

*Dr. Paul M. Pitts, Jr.
Vice President - Chemical Operations
ARCO Chemical Company

Dr. Rustum Roy
Director, Materials Research Laboratory
Pennsylvania State University

Mr. Chester A. Sadlow
Director, Health Systems Division
Westinghouse R & D Center

Mr. John H. Schmid
Vice President for Corporate Engineering
Zurn Industries

Dr. Frank W. Smith
Vice President for Research
Mine Safety Appliance Corporation

Dr. Timothy R. Talbot, Jr.
Director
Institute for Cancer Research

*Mr. Frank M. Temmel
Manager, Metallurgical & Chemical Process Research
Bethlehem Steel Corporation

Dr. Raymond L. Wilkins
Head of the Instrument Research & Development Laboratory
Rohm and Haas Company

*Dr. Otto W. Witzell
Dean, Graduate School
Drexel University

*Mr. Robert Sidman
Executive Director
Governor's Energy Task Force

**Mr. Robert D. Laughlin
Executive Secretary (GSAC)
Director, Bureau of Scientific & Technological Development
Department of Commerce

*Members, Energy Management Panel
**Ex-officio Member, Energy Management Panel
***Chairman, Energy Management Panel